

*Ilex omeiensis* H. H. Hu & Tang (1940) and *Ilex omeiensis* S. Y. Hu (1946) are exact synonyms, being based on the same collections. I was unaware of the 1940 publication when I prepared my description in 1942. Since under war conditions there was no exchange of publications between occupied China and free China, I saw no copy of the Hu and Tang paper until after I reached Boston. It is of some interest to note that regarding this species, known as yet only from Mt. Omei, we independently reached the same conclusion, even selecting the same specific name for the species.

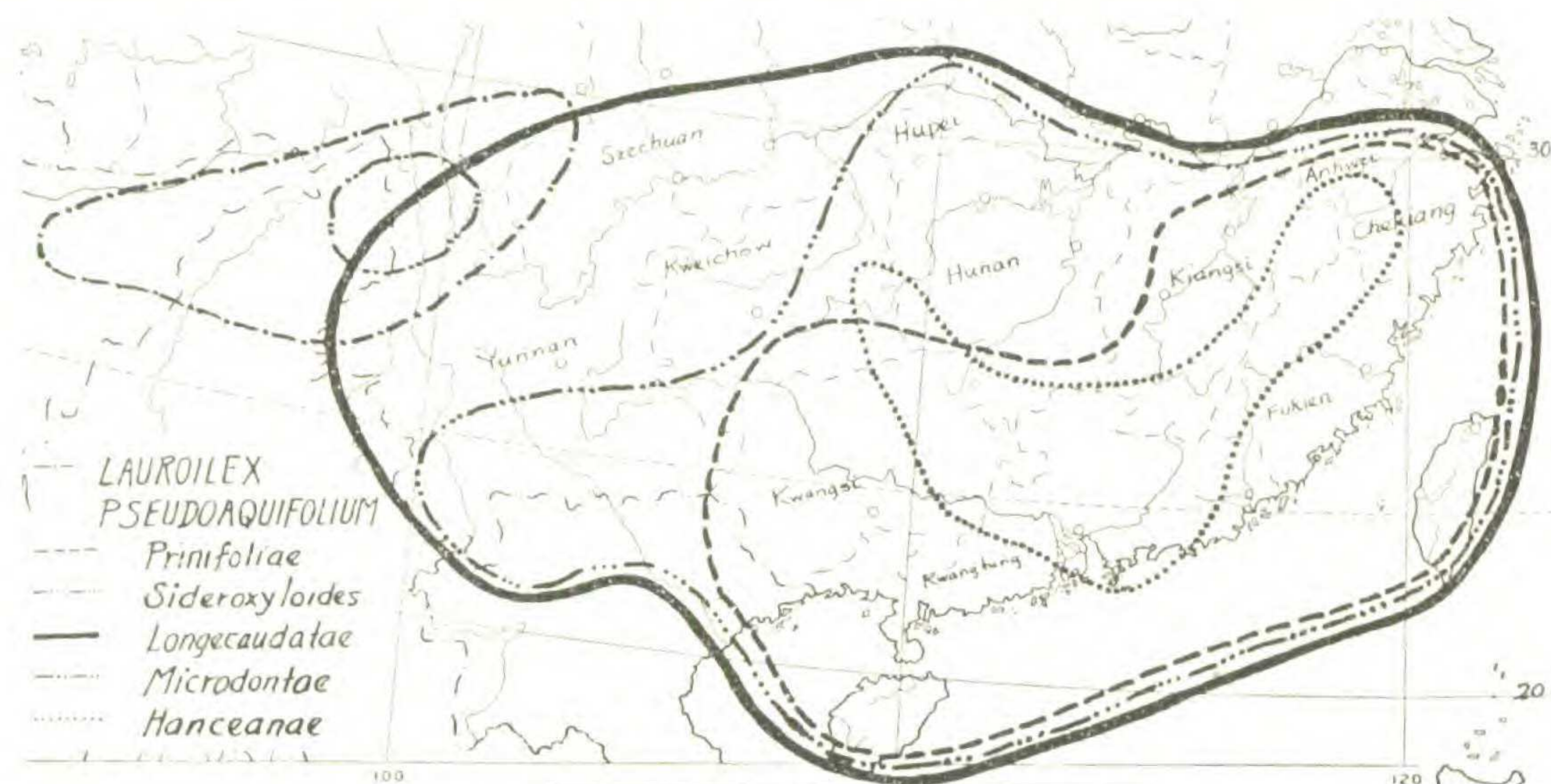


FIG. 9. Geographic distribution of the sections *Lauroilex* and *Pseudoaquifolium* including the five series of the latter section.

85. *Ilex venulosa* Hook. f., Fl. Brit. Ind. 1: 602. 1875; Loes. in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 89 (Monog. Aquif. 1: 89). 1901; Anon. in Notes Bot. Gard. Edinb. 17: 10, 155, 173. 1929-30; Comber in Notes Bot. Gard. Edinb. 18: 58. 1933.

An entirely glabrous evergreen shrub (ex Forrest) or a small tree (ex Tsai) up to 8 m. high, with entire coriaceous caudate leaves, 15-22 pairs of prominent parallel lateral nerves, pseudo-paniculate rarely fasciculate compound cymes, small fruits, and 5-7 smooth coriaceous striate pyrenes.

Branchlets subfuscous or nigrescent, minutely rimulose; second year's growth 4-5.5 mm. thick, the lenticels conspicuous, white, elliptic; current year's growth slightly angular, 3 mm. thick, plicate, shiny, nigrescent. Leaves on both first and second years' growth, 1-3 cm. apart; stipules deltoid, acute, 1 mm. long; petioles cylindric, rather robust, 1.3-2.2 cm. long, 2 mm. thick, one-seventh to one-fifth the length of the lamina, narrowly canaliculate above, plicate-rugose beneath; lamina coriaceous, olivaceous or brunneo-olivaceous, opaque on both surfaces, ovate or oblong-elliptic, 10-20 cm. long, 3-6.5 cm. wide; base rounded or obtuse; apex caudate-acuminate, the acumens very narrow, 2-3 cm. long; margin entire; midrib deeply sulcate above, strongly elevated and prominent

beneath; lateral nerves 15–22 on each side, elevated on both surfaces, the reticulations prominent on both surfaces. Inflorescences pseudo-paniculate or rarely fasciculate, axillary on second year's growth, very rarely solitary at the base of a new branch, the central axis 4–30 mm. long, 1.5–2 mm. in diameter. Staminate inflorescences: individual branches of the panicles cymose, 2–4 times trichotomous; peduncles 10–17 mm. long, subtended by a broad deltoid, warty, acute bract with 2 stipule-like appendages, the secondary axes 3–5 mm. long, the bracts deltoid, acute; pedicels 2 mm. long, with 2 basal prophylla; flowers 5- or 6-merous; calyx patelliform, 3 mm. across, the lobes ovate, deltoid, ciliate; corolla rotate, 6 mm. across, the petals oblong-ovate, 2.5 mm. long, 1.8 mm. wide, one-sixth connate at the base; stamens slightly shorter than the petals, the anthers oblong-ovoid, 1 mm. long; rudimentary ovary subglobose-ovoid, the apex obtuse. Pistillate inflorescences: individual branches of the panicles trichotomous cymose or subumbelliform; peduncles 7–12 mm. long; pedicels 2–3 mm. long; calyx 2–3 mm. across, 6–8-lobed, the lobes deltoid, ciliate; corolla suberect, 3–4 mm. across, the petals obovate, 1.5 mm. long, one-fifth connate at the base; staminodes one-third the length of the petals, the sterile anthers cordiform; ovary ovoid-globose, 1.5 mm. long, the stigma capitate, 5–7-lobed. Fruit globose, red, 3–4 mm. in diameter, the persistent calyx 3 mm. across, the stigma navel-like or thin-discoid. Pyrenes 5–7, oblong-ovoid in outline, in cross-section trigonous, 2 mm. long, 1 mm. wide, 3-striate, the striae slightly elevated, sometimes branched, the sides smooth, the endocarp coriaceous.

CHINA: Yunnan: without precise locality, *G. Forrest* 7530 (A), 9801 (A), 13672 (A), 15725 (A), 16063 (A), 21085 (A), 26168 (NY), 26216 (A), 26218 (A, NY, US); *M. K. Li* 1133 (A); Teng-yueh, *J. F. Rock* 7972 (A); Lu-se-hsien, *T. H. Tsai* 56402 (A); Mong-ko, *H. T. Tsai* 56425 (A).

UPPER BURMA: Kachin Hills, *Shaik Mokim* in 1889 (A).

INDIA: Khasia, *Griffith* (G); *Lemann* in 1844 (G); *Oldham* 8 (A); *Schlagintweit* in 1855 (G); East Bengal, *Griffith* 2009 (G); *Hooker & Thomson* *Ilex* (8), (G); Assam, *King's Collector* (A).

This plant was first described from specimens collected in northern India. It is a shrub growing in thickets or a tree occurring in woods. Its dull yellow flowers appear in February and March.

It is allied to *Ilex omeiensis* H. H. Hu & Tang, but the latter has fasciculate umbels, acuminate but not caudate leaf-apices, and only 6–8 pairs of obscure lateral nerves.

85a. *Ilex venulosa* var. *simplicifrons*, var. nov.

A typo differt inflorescentiis magis compactis, cymis valde reductis, parvis, paucifloris; pedunculo 2 mm. longo.

CHINA: Yunnan: Teng-yueh, *G. Forrest* 9800 (A, TYPE).

INDIA: Khasia Hills, ex Herb. Forest School, Dehra Dun (A).

This variety differs from the typical *Ilex venulosa* in having more compact inflorescences with much reduced cymes, which are smaller in size

and fewer flowered than in the typical form. The peduncles are only 2 mm. long.

#### SECTION IX. PSEUDOAQUIFOLIUM, SECT. NOV.

Arbor vel frutex; foliis integerrimis, raro crenulato-serratis; inflorescentiis fasciculatis; floribus 6-8-meris (raro 4-meris); pyrenis 6-8, raro 4, striatis, esulcatis, raro sulcatis, endocarpio coriaceo, raro sublignescente.

Twenty-seven species in five series occur mostly in South China. The range of each series is as shown in Figure 9.

#### KEY TO THE SERIES

- A. Endocarp of the pyrenes sublignescent; pyrenes 3-striate and 2-sulcate, the striae clinging to the endocarp; branchlets slender, so ridged that the cross-section appears quadrangular.....Series 1. *Prinifoliae*.
- AA. Endocarp coriaceous; pyrenes smooth, or striate and esulcate, the striae easily detached from the endocarp; branchlets subterete.
  - B. Fruiting pedicels 8-20 mm. long; always longer than the diameter of the fruit; fruit in fascicles or pseudoracemes.
    - C. Fruit 5-8, rarely 4 mm. in diameter, with columnar or capitate stigma (except *Ilex kobuskiana*); the style usually evident.....Series 2. *Sideroxyloides*.
  - CC. Fruit 3-4 rarely up to 5 mm. in diameter, the style lacking, the stigma thin-discoid.
    - D. Leaves entire, the apex usually caudate; pyrenes 4, rarely 5.....Series 3. *Longecaudatae*.
  - DD. Leaves serrate, crenate or subentire; pyrenes 6 or 7....Series 4. *Microdontae*.
- BB. Fruiting pedicels 1-3 mm. long, always shorter than the diameter of the fruits; fruit usually in pairs.....Series 5. *Hanceanae*.

#### SERIES 1. PRINIFOLIAE, STAT. NOV.

*Ilex* subgen. *Euilex*, series C. *Aquifolium*, sect. 4, *Prinifoliae* Loes. in Engler & Prantl, Nat. Pflanzenfam. Nachtr. 220. 1897, et in Nov. Act. Acad. Caes. Leop.-Carl. Nat. Cur. 78: 356 (Monog. Aquif. 1: 356). 1901.

Evergreen shrubs or small trees with slender angular pubescent branchlets; leaves chartaceous or membranaceous, entire, subentire, or pauciserrate, the apex acute and the tip mucronate or cuspidate, usually pubescent; inflorescences fasciculate or pseudopaniculate; flowers 4-8-merous; stamens shorter than the petals; ovary with an evident style; fruit with 5, 6, or 7 pyrenes; pyrenes 3-striate, the endocarp thick-coriaceous or sublignescent.

A transitional group between the fasciculate and the cymose species and also between the evergreen and the deciduous species.

## KEY TO THE SPECIES

- A. Individual branches of the pistillate fascicles 1-5-flowered; uniflorous pedicels 5 mm. long; peduncles of the cymes 3-7 mm. long.....86. *I. stewardii*.
- AA. Individual branches of the pistillate fascicles uniflorous, rarely 1-3-flowered; fruiting pedicels 2-3 mm. long; peduncles of the cymes 1-3 mm. long.
- B. Leaves serrate or subentire, the lamina elliptic or obovate-elliptic, hirsute; branchlets hirsute. (East and South China).....87. *I. pubescens*.
- BB. Leaves entire, the lamina broad-elliptic or obovate-oblong, glabrous; branchlets puberulous. (Hainan and southwest Kwangsi).....88. *I. hainanensis*.

86. *Ilex stewardii*, sp. nov.

Frutex vel arbor parva; ramulis puberulentibus, foliis chartaceis vel crasse membranaceis, integerrimis, lanceolatis, oblongo-lanceolatis vel oblongo-ellipticis, 5-8.5 cm. longis, 1.4-3 cm. latis, apice acuminatis vel caudatis, acuminibus 8-15 mm. longis, costa supra impressa, nervis lateralibus 9-11 paribus, supra evidentibus, subtus prominentibus; inflorescentiis foemineis fasciculatis vel pseudopaniculatis, compositis 1-5-floribus cymis, pedunculis 3-7 mm. longis, pedicellis 3-5 mm. longis, floribus 6-vel 7-meris, calycibus eciliatis, corolla rotata, petalis 1.5-2 mm. longis; staminodiis quam petalis  $\frac{1}{2}$  brevioribus, ovario ovoideo, stigmatibus crasse discoideo; fructibus 3 mm. diametro, stylis evidentibus; pyrenis 6, 3 mm. longis, 1 mm. latis, dorso 3-striatis, esulcatis, endocarpio coriaceo.

An evergreen shrub or small tree up to 8 m. high, with minutely puberulent branchlets, lanceolate, oblong-lanceolate, or oblong-elliptic chartaceous entire leaves with a long-acuminate or caudate apex, fasciculate or pseudopaniculate pistillate inflorescences, small ovate-subglobose fruits, and 6 or 7 longitudinally striate-esulcate coriaceous pyrenes.

Branchlets brunneous, the third year's growth 2.5-4 mm. in diameter, longitudinally plicate-rugose, minutely and unevenly rimulose, the lenticels lacking, the leaf-scars narrowly subcrescent-shaped, slightly elevated; second year's growth 2 mm. in diameter, subquadrangular, ridged, puberulous; current year's growth slender, 1-1.5 mm. in diameter, longitudinally deeply canaliculate, sparsely and distinctly puberulent, the terminal buds poorly developed, usually abortive, with loose acute and narrow scales. Leaves occurring even on the third year's growth, 7-14 mm. apart; stipules long-deltoid, callose, acute, persistent; petioles 5-8 mm. long, about one-tenth the length of the lamina, narrowly and deeply canaliculate and minutely puberulous above, glabrous and rugose beneath; lamina chartaceous or thickly membranaceous, brunneous-olivaceous, shiny above, opaque and epunctate beneath, lanceolate, lanceolate-oblong or narrowly oblong-elliptic, 5-8.5 cm. long, 1.4-3 cm. wide; base acute or acuminate, rarely obtuse; apex long-acuminate or caudate, the acumen 8-15 mm. long, the point cuspidate or mucronate; margin entire, very rarely pauciserrate near the apex; midrib narrowly and deeply impressed and minutely puberulous

above, elevated and glabrous beneath, the lateral nerves 9–11 pairs, evident above, prominent beneath, the reticulation of the secondary nerves and the veinlets conspicuous underneath. Pistillate inflorescence fasciculate or pseudopaniculate, sessile, puberulous, the central axis 3–12 mm. long, with active or abortive terminal buds; bracts broadly deltoid, acute, persistent; individual branches 1–5-flowered, when uniflorous the pedicels 5 mm. long with 2 submedian prophylla; when multiflorous cymose or subumbelliform, the peduncles 3–7 mm. long, the pedicels 3–5 mm. long, with 2 basal prophylla; flowers 6- or 7-merous; calyx patelliform, 2 mm. across, deeply lobed, the lobes ovate-deltoid, erose, eciliate, acute; corolla rotate, 4–5 mm. across, the petals oblong, 1.5–2 mm. long, one-sixth connate at the base; staminodes one-half the length of the petals, sagittate; ovary ovoid, 1.5 mm. long, 1 mm. wide; the stigma thick-discoid. Staminate flowers not seen. Fruit ovoid-subglobose, 4 mm. long, 3 mm. in diameter, when dry castaneous or nigrescent, the persistent calyx sub-explanate, 2.5–3 mm. across, the stigma thick-discoid, the style sometimes evident. Pyrenes 6, elliptic in outline, 3 mm. long, 1 mm. wide, the dorsal surface rough, 3-striate, esulcate, the sides smooth, the endocarp coriaceous.

CHINA: Kweichow: Tuh-shan, *Y. Tsiang* 6750 (NY). Kwangtung: Fang-ch'eng, *W. T. Tsang* 26658 (A). Kwangsi: Me-kon, Seh-feng-dar-shan, *R. C. Ching* 3867 (LU, NY), 7822 (NY); Lu-chen, *R. C. Ching* 5862 (LU, NY); Foo-lung, *H. Y. Liang* 69675 (A); Yung-hsien, *Steward & Cheo* 760 (TYPE, A; NY), 1082 (A, NY); Shang-sze, Shap-man-tai-shan, *W. T. Tsang* 2234 (A), 22519 (A), 22687 (A, LU), 23874 (A, NY), 23973 (A, NY), 24588 (A, NY); Young-yuen, *T. S. Tsong* (*Chan Men* on field label) 82145 (A).

INDO-CHINA: Tonkin: *A. Pételot* 3868 (NY); Ha-coi, Taai-wong-mo-shan, *W. T. Tsang* 26989 (A), 29240 (A); Dan-ha, Sai-wong-mo-shan, *W. T. Tsang* 29810 (A).

The description of the pistillate flower is drawn from *Tsang* 29810.

*Ilex stewardii* is endemic to the high mountains between Kwangtung, Kwangsi, and Indo-China, and grows as a shrub in woods or forests. It flowers in late June or July. The fruit is still green in August, turning red in November.

The sparsely puberulous slender quadrangular branchlets, the chartaceous entire leaves with prominent lateral nerves, the fasciculate or pseudopaniculate inflorescences, the cymose branches of the infructescence, and the small fruits of *Ilex stewardii* suggest close relationship with *Ilex hainanensis* Merr., but the latter has ovate-obovate or oblong leaves with abrupt and short-acuminate apex and dorsally canaliculate pyrenes.

This species is named after the collector of the type, Prof. A. N. Steward of the University of Nanking, my first botany teacher.

87. *Ilex pubescens* Hook. & Arn. Bot. Beechey Voy. 167, *pl.* 35. 1833; Steud. Nomencl. ed. 2, 1: 802. 1840; Benth. Fl. Hongk. 65. 1861; Maxim. in Mém. Acad. Sci. St. Pétersb. VII, 29(3): 40. 1881; Forbes & Hemsl. in Jour. Linn. Soc. Bot. 23: 117. 1886; Loes. in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 356 (Monog.

Aquif. 1: 356). 1901; Dunn & Tutcher in Kew Bull. Misc. Inf. Add. Ser. 10: 59. 1912; Yamamoto, Suppl. Ic. Pl. Form. 1: 39. 1925; Rehd. in Jour. Arnold Arb. 7: 157. 1927; Groff in Lingnan Sci. Bull. 2: 64. 1930; McClure in Lingnan Sci. Bull. 3: 25. 1931; Belval, Mus. Heud. Not. Bot. Chin. 2: 21. 1933; Hand.-Mzt. Symb. Sin. 7: 658. 1933.

*Ilex trichoclada* Hayata, Ic. Pl. Form. 3: 56. 1913.

A hirsute evergreen shrub up to 3 m. high (tree up to 17 m. high, ex Handel-Mazzetti), with slender subquadrangular branchlets, elliptic chartaceous or membranaceous subentire or argutely pauciserrate leaves, fasciculate inflorescences, 6-8-merous flowers, styliiferous ovary, shortly pedicellate globose fruit with capitate stigma and 6 or 7 pyrenes, 3-striate on the back.

Branchlets slender, somewhat zigzag, cinereous; third year's growth 3 mm. in diameter, subterete, longitudinally ridged and rugose, puberulent, the lenticels lacking, the leaf-scars small, nearly crescent-shaped, slightly elevated; second year's growth 2 mm. in diameter, hirsute, longitudinally ridged, appearing subquadrangular; current year's growth 1 mm. in diameter, longitudinally ridged and canaliculate, villose, the terminal buds often poorly developed or lacking. Leaves occurring also on second year's growth, 2-5 mm. apart; stipules acute, deltoid, callose, hirsute, persistent; petioles 2.5-5 mm. long, one-thirteenth to one-tenth the length of the lamina, hirsute or hispid; lamina chartaceous or membranaceous, olivaceous or atro-olivaceous, opaque and hirsute especially along the midribs, elliptic or obovate-elliptic, 2-5.5 cm., rarely up to 7 cm. long, 1-2.5 cm., rarely up to 3 cm. wide; obtuse at the base, acute or shortly acuminate at the apex, the acumen 3-7 mm. long, the point cuspidate; margin argute and pauciserrate or subentire; midrib plane or slightly impressed above, elevated beneath, the lateral nerves 4 or 5 pairs, obscure above, evident beneath, anastomosing near the margin, the reticulation of the veinlets obscure on both surfaces. Inflorescences fasciculate or pseudo-paniculate in the pistillate, hirsute, axillary on second year's growth only, with dormant or abortive terminal buds, the central axis (when present) 5-6 mm. long, the bracts minute, tricuspidate or deltoid, acute with 2 stipule-like appendages. Staminate inflorescences: individual branches of the fascicles uniflorous, rarely 3-flowered cymose, the pedicels 1-2 mm. long, with 2 minute basal prophylla; peduncles when present 1 mm. long; flowers 4- or 5-merous; calyx patelliform, 2 mm. across, deeply 5- or 6-lobed, the lobes ovate-deltoid, villose, eciliate; corolla 4-5 mm. across, the petals 4-6, ovate-oblong or obovate, 2 mm. long, 1.75 mm. wide, eciliate, one-sixth connate at the base; stamens three-fourths the length of the petals, the anthers oblong, 0.8 mm. long; rudimentary ovary pulvinate, the apex shortly rostellate. Pistillate inflorescences: individual branches of the fascicles 1- or rarely 3-flowered; pedicels 2-3 mm. long, the peduncles of 3-flowered cymes, 1-1.5 mm. long; flowers 6-8-merous; calyx 2.5 mm. across, deeply 6- or 7-lobed, the lobes acute, hirsute; corolla rotate, the petals 5-8, oblong, 2 mm. long; staminodes one-half the length of the

petals, the sterile anthers sagittate; ovary ovoid, 1.5 mm. long, 1.25 mm. wide, glabrous, the style evident, the stigma capitate or thick-discoid. Fruit globose, 4 mm. in diameter, the persistent calyx explanate, the style often evident, the stigma thick-discoid or capitate. Pyrenes 6, rarely 5 or 7, elliptic in outline, the ends pointed, 3 mm. long, 1 mm. wide, the dorsal surface roughened, 3-striate-esulcate, the sides smooth, estriate, the endocarp thick-coriaceous or sublignescens.

CHINA: Anhwei: Wu-yuen, *K. Ling* 7863 (A). Chekiang: Tih-tai-shan, *R. C. Ching* 1372 (A, US); Sia-chu, *R. C. Ching* 1716 (A, LU, US); Yen-tand, *H. H. Hu* 192 (A); Siu-chang-hsien, *H. H. Hu* 481 (A), Tsing-tai, *Y. L. Keng* 91 (A). Kiangsi: Tai-an-hong, *J. L. Gressitt* 1584 (A); Tung-ku, *Y. K. Hsiung* 6160 (A); Swe-chuen-hsien, *H. H. Hu* 844 (A); Kien-nan, *S. K. Lau* 3932 (A, US), 4395 (A, US); Tsoong-jen, *Y. Tsiang* 10129 (NY), 10217 (NY); *T. H. Wang* 185 (A), 341 (A). Fukien: Hing-hua, *H. H. Chung* 990 (A, LU); Min-how-hsien, *H. H. Chung* 2093 (A); Yen-ping, *H. H. Chung* 3266 (A, LU), 3356 (A), 3369 (A); Foochow, *H. H. Chung* 3710 (A), 3726 (A), 5284 (LU in part, NY), 5406 (A), 6421 (A, LU), 6906 (A), 7820 (A), 8009 (A); *O. Warburg* 5963 (A); Ing-hok, *H. H. Chung* 7731 (A, LU), 7974 (A, LU), 7983 (A); *S. G. Tang* 5976 (A), 6986 (A), 16544 (LU), 16571 (LU); Kudien, *H. H. Chung* 7922 (A, LU); Gang-ken, *J. L. Gressitt* 1722 (A). Kwangtung: Ta-ching, *W. Y. Chun* 5521 (A); Bei-shen, *W. Y. Chun* 5659 (A); Chang-kiang, *W. Y. Chun* 5810 (A); Pan-lung-tsze, *W. Y. Chun* 6109 (A); Teng-wu-shan, *W. Y. Chun* 6377 (A, US); *C. O. Levine* (CCC 2026, A); Wat-shui-shan, *W. Y. Chun* 7385 (A); Tsang-shing, *H. Fung* 405 (LU 18910, NY); *Handel-Mazzetti* 905 (A); Canton, *C. O. Levine* (CCC 616, A, US), 687 (US), 1770 (US), 1934 (A), 3173 (A); Wung-yuen, *S. K. Lau* 650 (A, NY); Kao-yao, *S. K. Lau* 20137 (NY); Loh-fou Mountain, *H. T. Ho* 60172 (NY); *E. D. Merrill*, 10298 (A), 11123 (A); *Y. Tsiang* 1646 (A); Yao-shan, *S. S. Sin* 9058 (NY), 9366 (NY), 9766 (NY), 11172 (NY); Tseng-shing, *W. T. Tsang* 20307 (NY); Loh-chang, *W. T. Tsang* 20779 (A, NY); Ta-pu, *W. T. Tsang* 21160 (A), 21737 (A); Jen-hwa, *W. T. Tsang* 26459 (A); Lo-chong, *Y. Tsiang* 1276 (A), 1416 (A), *C. L. Tso* 20298 (NY), 20403 (NY); Sun-yi, *Y. Tsiang* 2731 (A); Wai-yang, *T. M. Tsui* 125 (A, US); Ying-Tak, *T. M. Tsui* 314 (NY), 350 (NY); Yang-shan, *T. M. Tsui* 641 (NY); Kau-mo-shan, *Wang* 365 (A); Ou-chien-kieng, *Wang* 527 (A). Kwangsi: Sun-to, *W. T. Tsang* 23033 (A). Hongkong: Beechey (fragment of TYPE, A); *W. Y. Chun* 4902 (A), 4942 (A), 6579 (A), 6586 (A), 6588 (A), 6694 (A); *Faber* 9065 (A); *C. Ford* (NY); *Mrs. L. Gibbs* 7498 (A); *T. N. Liou* 809 (NY); *Reeves* (CB); *C. S. Sargent* in 1903 (A); *Y. Tsiang* 163 (A), 2957 (NY); *C. Wright* in 1853-55 (NY, US). Lantau Island: *W. T. Tsang* 16597 (A); *C. L. Tso* 20100 (A). Taiwan: Shin-ten, *U. Faurie* 416 (A); Lake Candidius, *J. L. Gressitt* 207 (A, NY), 216 (A, NY); South Cape, *A. Henry* 254 (NY); *R. Kanchira* 21329 (A); Tai-hu, *Y. Kudo* in 1929 (A); Nanto, *E. H. Wilson* 9972 (A), 11184 (A, US); Taihoku, *E. H. Wilson* 10251 (A), 10271 (A, US). Without precise locality, *A. Henry* (NY); *Y. Yamamoto* in 1929 (TU).

All of Wilson's numbers were originally labeled *Ilex trichoclada* Hayata. *Chung* 5284 is a mixture of specimens. In New York Botanical Garden

it is called *Ilex pubescens*. In the Arnold Arboretum it is called a *Vaccinium*.

*Ilex pubescens* has a very wide range of distribution in the warm temperate and sub-tropic southeastern China. There it grows as a shrub or small tree in thickets and woods. Its pinkish flowers appear in May. The fruit becomes red in October.

The hirsute indumentum, the chartaceous or membranaceous leaves, the 4-6 or even 7-merous flowers, the short stamens, and the shortly pedicellate fruits of *Ilex pubescens* indicate relationship with the deciduous Japanese *Ilex serrata* Thunb. var. *sieboldii* (Miq.) Rehd., but the latter has solitary inflorescences in the axils of the leaves of the current year's growth, and these are always found behind the axillary buds. Moreover, in the case of the latter entity the calyx is ciliate and the pyrenes are smooth. The subquadrangular branchlets, the fasciculate or pseudopaniculate inflorescences, the deeply lobed eciliate and erose calyx, and the small subglobose fruit of *Ilex pubescens* also indicate close relationship with *Ilex hainanensis* Merr., but the latter species has oblong or obovate glabrous leaves, dorsally canaliculate pyrenes and nearly glabrous branchlets.

87a. *Ilex pubescens* var. *kwangsiensis* Hand.-Mzt. in *Sinensia* 3(8): 189. 1933.

Branchlets densely villose; leaves thick-chartaceous, brunneous-olivaceous, villose, oblong or obovate, 4-8 cm. long, 2-7 cm. wide, the base obtuse or rarely cuneate, the apex abruptly acuminate; inflorescences pseudopaniculate, usually with active terminal buds; fruit globose, 3 mm. in diameter, the persistent calyx ciliate; pyrenes 6 or 7, 2.25 mm. long, 0.8 mm. wide, roughened on the dorsal surfaces, 3-striate-esculate, the endocarp coriaceous.

CHINA: Kwangsi: Ba-ka-shan, W. Po-seh, R. C. Ching 7403 (NY, ISOSYNTYPE), 7522 (NY, ISOSYNTYPE); Lin-yuin-hsien, Steward & Cheo 662 (A, NY).

This variety differs from typical *Ilex pubescens* in having larger leaves with an abruptly acuminate apex, numerous prominent veins, and smaller fruits and pyrenes.

*Ilex pubescens* var. *kwangsiensis* is isolated in western Kwangsi. There it grows as a shrub up to 4 m. high, where the white flowers appear in June.

In the form of the leaf and the venation, this variety resembles *Ilex hainanensis* Merr. more than *Ilex pubescens*. The ciliate calyx of this variety resembles that of *Ilex serrata* Thunb. var. *sieboldii* (Miq.) Loes. Our specimens appear to be very poorly selected and do not seem to represent normal growth. More adequate material may prove that the plant deserves the rank of a species.

88. *Ilex hainanensis* Merr. in *Lingnan Sci. Jour.* 13: 60. 1934; Tanaka & Odashima in *Jour. Soc. Trop. Agr.* 10: 372. 1938; Masamune *Fl. Kainant.* (Hainan) 174. 1943.

*Ilex rotunda* Thunb. var. *hainanensis* Loes. in *Nov. Act. Acad. Caes. Leop.-*



Carol. Nat. Cur. 78: 108 (Monog. Aquif. 1: 108). 1901. *Syn. nov.*

An evergreen tree up to 5 m. high with slender, considerably ridged, sparsely puberulous branchlets, broad-elliptic, obovate- or ovate-oblong leaves, fasciculate inflorescences, 5- or 6-merous flowers, and globose fruits with dorsally canaliculate pyrenes.

Branchlets rather zigzag, longitudinally ridged, castaneous or brown, the older portion cinereous; third year's growth 2.5–3 mm. in diameter, ridged, subquadrangular, rugose, glabrescent, the lenticels lacking, the leaf-scars narrowly crescent-shaped, much elevated; second year's growth 1.5–2 mm. in diameter, considerably ridged, sparsely puberulous; current year's growth 1 mm. in diameter, deeply and longitudinally canaliculate, sparsely and distinctly puberulous, the terminal buds very thin, usually poorly developed and abortive. Leaves occurring also on the second year's growth, 5–12 mm. apart; stipules callose, acute-deltoid, 1 mm. long; petioles 5–10 mm. long, one-tenth to one-fifth the length of the lamina, deeply and narrowly canaliculate above, puberulous in the grooves only; lamina thin-coriaceous or chartaceous, olivaceous or castaneous-olivaceous, opaque or slightly shiny above, opaque beneath, broad-elliptic, obovate- or ovate-oblong, 3–7 cm. long, 1.5–2.5 cm. wide; obtuse at the base; abruptly short-acuminate at the apex, the acumen 3–7 mm. long, the tip acute or mucronate; margin entire, very rarely 1- or 2-toothed near the apex; midrib deeply impressed and minutely puberulous above, elevated and glabrous beneath, the lateral nerves ca. 10 pairs, prominent on both surfaces, the reticulation of the veinlets prominent beneath. Inflorescences fasciculate or pseudopaniculate, on second year's growth, with active or abortive terminal buds, the central axis 4 mm. long, sparsely puberulous, the bracts deltoid, acute, often deciduous. Staminate inflorescences: individual branches of the fascicles 1–5-flowered, subumbelliform; peduncles 1–3 mm. long, the pedicels 1 mm. long with 2 basal prophylla; flowers 5- or 6-merous; calyx patelliform, 2 mm. across, deeply 5- or 6-lobed, the lobes ovate-deltoid, obtuse, erose, eciliate, glabrous; corolla rotate, 5–6 mm. across, the petals ovate, 1.8 mm. long, 1.5 mm. wide, eciliate, one-sixth connate at the base; stamens three-fourths the length of the petals, the anthers oblong, 1 mm. long; rudimentary ovary pulvinate, the apex shortly rostellate. Pistillate inflorescences: individual branches of the fascicles 1–3-flowered cymose; peduncles 1–3 mm. long, the pedicels 3 mm. long, with 2 minute basal prophylla; calyx and corolla as in the staminate flowers; staminodes one-half the length of the petals, the sterile anthers sagittate, with the apex mucronate; ovary ovoid, 1.5 mm. in diameter, glabrous, the stigma thick-discoïd, lobed. Fruit subglobose-ellipsoid, 4 mm. long, 3 mm. in diameter, when dry longitudinally sulcate, the persistent calyx subexplanate, 3 mm. across, the lobes deltoid, 1 mm. long, obtuse, the stigma thick-discoïd or capitate, the style sometimes evident. Pyrenes 6, rarely 5, elliptic in outline, the ends pointed, 3 mm. long, 1 mm. wide, the dorsal surface roughened and canaliculate, the sides smooth, the endocarp subwoody.

CHINA: Kwangsi: Foo-lung, Sup-man-ta-shan, *H. Y. Liang* 69676 (A). Hainan: Ling-shui, *H. Fung* 20086 (ISOTYPE, A; TYPE, NY); without precise locality, *A. Henry* in 1889 (type of *Ilex rotunda* var. *hainanensis*, fragment, A); Yai-chow, *F. C. How* 70697 (A, NY, US); E. Wong Mountain, *H. Y. Liang* 63663 (A, NY); Bak-sa, *S. K. Lau* 26322 (A), 26327 (A); Lok-tung, *S. K. Lau* 27433 (A).

*Ilex hainanensis* was first described from Hainan Island as a small-leaved tree growing in woods. The pink flowers appear in April or May. Similar plants have been recently collected in the high mountains of southeastern Kwangsi.

The subquadrangular branchlets, the fasciculate inflorescences, the 5- or 6-merous flowers, the short stamens, the rostellate rudimentary ovary, the small fruits, and the elliptic sublignified pyrenes of *Ilex hainanensis* indicate a very close relationship with *Ilex pubescens* Hook. & Arn., but the latter has hirsute branchlets, subentire or pauciserrate leaves, and 3-striate esulcate pyrenes. By the entire shortly acuminate leaves and the small subglobose fruit one may be misled into relating the species to *Ilex rotunda* Thunb. But the latter can easily be distinguished by its simple cymose inflorescences in the leaf-axils of the current year's growth only. Though rarely, it does sometimes happen that some of the active terminal buds of the fasciculate inflorescences of *Ilex hainanensis* do develop into leafy shoots with crowded cymose or subumbelliform inflorescences in the axils of the scales or even of the lower leaves at their bases. Even in such cases the identity of the species can be recognized by the large number of fasciculate inflorescences.

#### SERIES 2. SIDEROXYLOIDES (LOES.), STAT. NOV.

*Ilex* subgen. *Euilex* ser. *C. Aquifolium*, sect. *Microdontae*, subsect. *Sideroxyloides* Loes. in Engler & Prantl, Nat. Pflanzenfam. Nachtr. 220. 1897, et in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 349 (Monog. Aquif. 1: 349). 1901.

Leaves entire, thick-coriaceous, coriaceous or subcoriaceous, olivaceous or griseo-olivaceous, rarely slightly brunneous-olivaceous; inflorescences axillary, fasciculate, the staminate fascicles composed of single-flowered pedicels or 3-flowered cymes, the pistillate fascicles of 1-flowered pedicels; fruits globose, the diameter smaller than the length of the pedicels, the stigma prominent, columnar or capitate, the style often distinct, the persistent calyx larger than half the diameter of the fruits; pyrenes 4-7, striate but not sulcate, the striae loosely attached to the coriaceous smooth endocarp.

#### KEY TO THE SPECIES

- A. Leaves not glandular-punctate, the apex obtuse, acute, or acuminate.  
 B. Branchlets pilose; leaves linear-lanceolate or oblanceolate, 5-15 mm. wide; individual branches of the pistillate fascicles 1-3-flowered, the flowers 5-8-merous. (Hupei-Kwangsi)..... 89. *I. metabaptista*.

- BB. Branchlets glabrous or puberulous; leaves ovate, oblong, elliptic or obovate, usually over 2 cm. wide; individual branches of the pistillate fascicles uniflorous.
- C. Branchlets and petioles glabrous; individual branches of the staminate fascicles always uniflorous; exocarp of the fruit coriaceous; pyrenes unistriate on the back. (Central China) . . . . .90. *I. elmerrilliana*.
- CC. Branchlets and petioles puberulous; individual branches of the staminate fascicles 1-3-flowered, rarely more; exocarp of the fruit membranaceous.
- D. Leaves thick-coriaceous; lateral nerves 7-8 on each side of the midrib, indistinct; pyrenes 4 or 5. (Hongkong and South China) . . . . .91. *I. memecylifolia*.
- DD. Leaves coriaceous; lateral nerves 11-14 on each side of the midrib, evident beneath; pyrenes 6 or 7. (Yunnan) . . . . .92. *I. sinica*.
- AA. Leaves glandular-punctate, the apex rounded and emarginate, or acuminate with retuse, obtuse, or acute tips.
- B. Leaves thick-coriaceous, obovate; apex rounded and strongly emarginate or rarely obtuse. (Kwangtung) . . . . .93. *I. tutcheri*.
- BB. Leaves coriaceous or subcoriaceous, linear, oblong or elliptic; apex acuminate, the tip retuse or obtuse, rarely acute.
- C. Leaves linear-lanceolate, less than 2.5 cm. wide; individual branches of staminate fascicles cymose, the peduncles 8-10 mm. long, 3 or 4 times as long as the pedicels. (Kwangsi and adjacent provinces) . . . . .94. *I. salicina*.
- CC. Leaves ovate-oblong or oblong-elliptic, averaging 4 cm. wide; peduncles of the staminate flowers variable.
- D. Pedicels of the fruit 28-32 mm. long; leaves very large, 18-25 cm. long, 6-7 cm. wide; petioles comparatively short, ca. one-twentieth the length of the lamina. (Hainan) . . . . .95. *I. dolycopoda*.
- DD. Pedicels of the fruit 5-9 cm. long; leaves less than 16 cm. long and less than 5 cm. wide.
- E. Peduncles of the staminate flowers more or less equaling the pedicels in length; stigma of the fruit navel-like; pedicels 5-8 mm. long; leaves ovate-oblong, rarely elliptic, 4.5-9 cm. long, brunneous; the apex abruptly acuminate, the tip retuse.
- F. Flowers 5-8-merous; branchlets glabrous. (Kwangtung and Hainan) . .96. *I. kobuskiana*.
- FF. Flowers 4-merous, rarely the calyx 5-lobed; branches puberulous. (Kwangsi) . . . . .97. *I. retusifolia*.
- EE. Peduncles of the staminate flowers three times as long as the pedicels; stigma on fruits columnar-mammiform; pedicels 8-15 mm. long; leaves elliptic or oblong-elliptic, olivaceous; the apex never retuse. (Taiwan, Hainan, Indo-China) . . . . .98. *I. cochinchinensis*.

89. *Ilex metabaptista* Loes. ex Diels in Bot. Jahrb. 29: 435. 1900, nom. nud., in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 238 (Monog. Aquif. 1: 238). 1901, descr., et in Sarg. Pl. Wils. 1: 78. 1911; Chun in Sunyats. 4: 224. 1940.

A pilose evergreen shrub or small tree up to 4 m. high with small lanceolate to oblanceolate subentire leaves, fasciculate inflorescences, columnar stigma, and 5–8 striate coriaceous pyrenes.

Branchlets pilose, older ones cinereous; younger parts castaneous; third year's growth 4 mm. in diameter, longitudinally striate-rugose, the lenticels sparse and inconspicuous, orbicular, the leaf-scars semi-orbicular, closely associated with the scars of the inflorescence; second year's growth 3 mm. in diameter, ridged below the attachment of the leaves, the lenticels often evident; current year's growth 2 mm. in diameter, ridged and canaliculate, pilose; terminal buds (when present) lanceolate, conic, very pilose. Leaves occurring also on second year's growth, 2–12 mm. apart; stipules minute, callose, broadly deltoid, pilose; petioles 3–8 mm. long, one-twelfth to one-eighth the length of the lamina, canaliculate above, pilose; lamina subcoriaceous, olivaceous or brown, lanceolate to oblanceolate, 3–8 cm. long, 5–15 mm. wide, pilose along the margin, lower surface, and midrib above; base acute or cuneate, narrowly decurrent; apex acute or obtuse and minutely apiculate; margins subentire, often minutely 1–2-toothed near the apex, pilose, when dry revolute; midrib impressed and pilose above; elevated beneath, the lateral nerves 6–8 on each side, obscure or on older leaves slightly impressed above, prominent beneath, the reticulations obscure. Inflorescences fasciculate, axillary, sessile, on second year's growth, hirsute, the persistent bud-scales minute, callose, broadly deltoid, 0.5 mm. long. Staminate inflorescences: individual branches of the fascicles 3-flowered, cymose, the bracts very small, tricuspidate; the peduncles 3–6 mm. long, the pedicels 1.5–2.5 mm. long, the bracteoles 0 or 1, basal; flowers white, 5- or 6-merous; calyx cyathiform, 3 mm. across, deeply 5- or 6-lobed, the lobes deltoid-ovate, obtuse, pilose, ciliate; corolla rotate, 5–6 mm. across, the petals oblong-ovate, 2 mm. long, eciliate; stamens slightly shorter than the petals, the anthers oblong, 0.75 mm. long; rudimentary ovary pulvinate, sulcate, the apex shortly acute. Pistillate inflorescences: individual branches of the fascicles uniflorous, rarely 2- or 3-flowered cymose; pedicels 4–5 (after fruiting up to 7) mm. long, with 0–2 median or rarely basal or supermedian prophylla; peduncles of occasional cymes 5–6 mm. long, the pedicels 3 mm. long; flowers 5–8-merous; calyx cyathiform, 3–4 mm. across, deeply 6-lobed, the lobes deltoid, hirsute and ciliate; corolla rotate, 6 mm. across, the petals oblong, 2 mm. long; staminodes two-thirds as long as the petals, the sterile anthers sagittate; ovary ovate-subpyramidal, the style evident, the stigma columnar, pubescent. Fruit ovoid-ellipsoid, 5–6 mm. long, 4–5 mm. in diameter, the persistent calyx subexplanate or patelliform, 4 mm. across, pilose and ciliate, the stigma columnar. Pyrenes 5–8, elliptic

in outline, 3.5–4 mm. long, 1.25 mm. wide, the ends pointed, the dorsal surface striate, esulcate, the endocarp coriaceous.

CHINA: Hupei (Hupeh): Pa-tung-hsien, *H. C. Chow* 579 (material for the description of the pistillate flowers) (A), 579A (NY); Ichang, *A. Henry* 1764 (ISOTYPE, A), 3343 (ISOTYPE, A), 3472 (ISOTYPE, A); Changyang-hsien, *E. H. Wilson* 138 (A), 756 (A, US); without precise locality, *E. H. Wilson* 866 (NY), 866A (A, NY, US), 866B (A). Kweichow: Wha-chou, Tsingchen, *S. W. Teng* 90386 (A); Kwei-ling, *Y. Tsiang* 5629 (NY). Kwangsi: Kiang-kou-hsien, *Steward, Chiao & Cheo* 950 (A, NY, US); Nam-tan-yuen, *C. Wang* 40931 (A).

*Ilex metabaptista* was first described from material collected from western Hupei. There it grows as a shrub at altitudes of 300–600 m. and flowers in April. The corollas are white. The fruits are red in December. In recent years the plant has been collected in Kweichow and Kwangsi. The Kweichow specimens are less hairy. So far as our material goes, the species appears to be distributed in a narrow band extending north and south along the Hupei-Hunan-Kweichow-Kwangsi border.

The narrowly lanceolate subentire leaves, the fasciculate inflorescences, the very minute bracts, the prominent columnar stigma, and the striate esulcate coriaceous pyrenes indicate close relationship with *Ilex salicina* Hand.-Mzt. That species, however, has punctate leaves.

89a. *Ilex metabaptista* var. *myrsinoides* (H. Lév.) Rehd. in Jour. Arnold Arb. 14: 240. 1933.

*Maesa myrsinoides* H. Lév. in Fedde, Rep. Spec. Nov. 10: 375. 1912, et Fl. Kouy-Tchéou 286. 1914.

*Myrsine Feddei* H. Lév. in Fedde, Rep. Spec. Nov. 10: 376. 1912, et Fl. Kouy-Tchéou 288. 1914.

*Embelia cavaleriei* H. Lév., Fl. Kouy-Tchéou 284. 1914.

*Ilex fargesii* var. *Bodinieri* Loes. apud H. Lév., Fl. Kouy-Tchéou 200. 1914.

Branchlets cinereous, the current year's growth almost glabrous; leaves lanceolate or oblanceolate, subentire, often with 1–3 teeth near the apex, glabrous except the midrib above; inflorescences fasciculate, very sparsely and minutely puberulent; calyx ciliate; corolla rotate; rudimentary ovary subglobose, inconspicuously sulcate, the apex mucronate.

CHINA: Kweichow: *J. Cavalerie* 579 (TYPE of *Maesa myrsinoides* (K; photo, A; fragment, N.Y.); *E. Bodinier* 2310, in part (TYPE of *Ilex fargesii* var. *bodinieri*, fragment and photo, A), 842 (TYPE of *Myrsine feddei*, fragment, A); *J. Cavalerie* in Herb. E. Bodinier 2635 (TYPE of *Embelia cavaleriei*, fragment, A); *S. W. Teng* 90386B (A); *Y. Tsiang* 8525 (A).

This variety occurs in Kweichow on the western flank of the range of *Ilex metabaptista*. Its white flowers appear in May.

This variety differs from the typical *Ilex metabaptista* in having less puberulent branchlets, leaves, and inflorescences. Since the change in the indumentum is so gradual, it might be better to consider this as merely a form rather than as worthy of varietal rank.

90. *Ilex elmerrilliana*, sp. nov.

*Ilex memecylifolia* sensu Rehd. in Jour. Arnold Arb. 8: 157. 1929, non Champ.

Frutex vel arbor parva, glaberrima; foliis crasse coriaceis, oblongo-ellipticis, 5–9 cm. longis, 2–3.5 cm. latis, basi cuneatis vel acutis, apice breviter acuminatis (acumine deltoideo 6–8 mm. longo) margine integerrimis, costa supra impressa, glabra, subtus elevata, nervis lateralibus obsoletis; inflorescentiis pseudofasciculatis, unifloris; pedicellis 5–10 mm. longis; floribus 5–8-meris, calycibus 3.5 mm. diametro, eciliatis; corolla 7–8 mm. lata, petalis eciliatis; staminibus quam petalis paullo brevioribus, glabris; fructibus globosis, 5 mm. diametro, stylis prominentibus 1 mm. longis, stigmatibus columnaribus; pyrenis 6 vel 7, levibus, oblongis, 3.5 mm. longis, 1-striatis, striis rimosis.

An evergreen shrub or small tree up to 5 m. high with glabrous branchlets, thick-coriaceous, oblong-elliptic entire leaves, pseudofasciculate inflorescences, globose fruit with a columnar stigma and 6 or 7 pyrenes with smooth coriaceous endocarp and a single branched longitudinal median ridge.

Branchlets rather stout, the third year's growth 3–4 mm. in diameter, longitudinally rimulose, the lenticels numerous, elliptic, inconspicuous, the leaf-scars semicircular, slightly elevated; second year's growth 3 mm. in diameter, longitudinally ridged and rugose, the lenticels lacking; current year's growth angular and ridged, 2 mm. in diameter, glabrous; the terminal buds narrowly conic, the scales very loose, glabrous, ciliate, with prominent stipule-like appendages. Leaves found even on third year's growth, 10–20 mm. apart; stipules narrowly deltoid, persistent; petioles 4–8 mm. long, ca. one-tenth the length of the lamina, glabrous, deeply grooved above, rugose beneath; lamina thick-coriaceous, olivaceous, shiny above, opaque beneath, elliptic or oblong-elliptic, 5–9 cm. long, 2–3.5 cm. wide; cuneate or acute at the base; abruptly acuminate at the apex, the acumen 6–8 mm. long, broadly deltoid; margin entire, when dry slightly recurved; midrib narrowly impressed and glabrous above, elevated beneath, the lateral nerves inconspicuous on both surfaces. Inflorescences pseudofasciculate, the fascicles with persisting or abortive terminal buds, the individual branches uniflorous; bracts ovate, glabrous; flowers 5–8-merous. Staminate inflorescences: pedicels 5–10 mm. long, glabrous, with 0–2 subbasal prophylla; calyx patelliform, 3.5 mm. across, 6–8-lobed, the lobes deltoid, acute-acuminate, eciliate; corolla rotate, 7–8 mm. across, the petals oblong, 3.5 mm. long, eciliate, one-fourth connate at the base; stamens nearly as long as the petals, glabrous, the anthers ovoid-oblong; rudimentary ovary conic, the apex obtuse, inconspicuously lobed. Pistillate flowers not seen (the staminode attached to certain young fruits glabrous). Fruit globose, 5 mm. in diameter, the persistent calyx explanate, 4 mm. across, the lobes acute, the style prominent, 1 mm. long, the stigma columnar. Pyrenes 6 or 7, oblong, in cross-section trigonous, 3.5 mm. long, 1.5 mm. wide, the endocarp coriaceous, smooth, with a single slender ridge on the back, slightly branched towards the lower end.

CHINA: Anhwei: Wu-yuan: *R. C. Ching 3307* (A, LU). Chekiang: without precise locality, *R. C. Ching 1368* (A); Tih-tai-shan, *R. C. Ching 1368A* (US). Wenchow: *R. C. Ching 1861* (A, LU, US); Tsing-tien, *Y. L. Keng 82* (A); Chin-yuen-hsien (Herb. Nat. Chek. Univ. *D 189*), (LU). Fukien: central Fukien, *Dunn* (ex Hongkong Herb. no. 2471) (A); Yen-ping, *H. H. Chung 3447* (A). Kiangsi: Tung-ku, *Y. K. Hsiung 6156* (A). Yi-fong: *Y. K. Hsiung 6433* (A); Lung-nan, *S. K. Lau 4410* (TYPE, A; US), *4776* (A, US).

This is a shrub or a tree growing in thickets and forests. The largest tree, according to data on the labels, is 16 m. high. Its white flowers appear in May.

In the form and texture of the leaves *Ilex elmerrilliana* is very similar to *Ilex memecylifolia* Champ. ex Benth., but the latter has puberulent branchlets, pubescent staminodes, and 4 or 5 reticulately striate woody pyrenes. The species is named in honor of Professor Elmer D. Merrill.

91. *Ilex memecylifolia* Champ. ex Benth. in Hook. Jour. Bot. Kew Gard. Miscel. 4: 328. 152; Walp., Annal. 4: 430. 1857; Benth., Fl. Hongk. 65. 1861; Maxim. in Mém. Acad. Sci. St. Pétersb. VII. 29: 37. 1881; Forbes & Hemsl. in Jour. Linn. Soc. Bot. 23: 117. 1886; Loes. in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 350 (Monog. Aquif. 1: 350). 1901; Dunn & Tutcher in Kew Bull. Add. Ser. 10: 60. 1912; Pitard in Lecomte, Fl. Gén. Indo-Chine 8: 852. 1912.

*Ilex memecylifolia* var. *oblongifolia* Champ. op. cit. 329. 1852; Loes. op. cit. 351. 1901.

An evergreen shrub up to 2 m. high with puberulent branchlets, ovate-oblong or obovate entire leaves, pseudofasciculate inflorescences, styliferous ovary, pubescent staminodes, globose fruits, each with a columnar stigma and 4 or 5 reticularly striate esulcate pyrenes.

Branchlets slender, third year's growth 2 mm. in diameter, smooth, the lenticels lacking, the leaf-scars semicircular, much elevated; second year's growth more slender, longitudinally wrinkled when dry; current year's growth 1 mm. in diameter, minutely puberulent, the terminal buds broadly ovoid, puberulent. Leaves occurring also on second year's growth, 8–17 mm. apart; stipules obliquely deltoid; petioles 5–7 mm. long, about one-eighth the length of the lamina, puberulent, narrowly canaliculate above; lamina thickly coriaceous, griseous- or brunneous-olivaceous, rather opaque on both surfaces, ovate-oblong or rarely obovate, 3.5–8.5 cm. long, 1.4–3.5 cm. wide, cuneate at the base; shortly and abruptly acuminate at the apex, the acumen 2–8 mm. long; margin entire; midrib puberulent and deeply impressed above, elevated beneath, the lateral nerves inconspicuous. Inflorescences pseudofasciculate, axillary on the second year's growth, the central axis 1–5 mm. long with a dormant or active terminal bud; flowers 4–6-merous. Staminate inflorescences: individual branches of the fascicles 1–3-flowered, the bracts deltoid, minutely puberulent; peduncles 1–2 mm. long, the pedicels 3–6 mm., rarely 7 mm. long, both puberulent;

the prophylla 0-2, basal or sub-basal; calyx patelliform, 2 mm. across, puberulent, 5- or 6-lobed, the lobes deltoid, obtuse, often erose, ciliate; corolla rotate, 5-6 mm. across, one-sixth connate at the base; petals 4 or 5, oblong, 1-2 mm. long, eciliate; stamens 4 or 5, equaling the petal in length, the anthers ovoid, 0.7 mm. long, glabrous; rudimentary ovary subglobose, apical end inconspicuously lobed. Pistillate inflorescences: individual branches of the fascicles uniflorous; pedicels 6-8 mm. long, with 1 or 2 basal prophylla; calyx and corolla as in the staminate flower; staminode three-fourths as long as the petals, both the filament and the sterile anthers puberulent; ovary subglobose-ovoid, 1.5-2 mm. in diameter, the style evident, 1 mm. long, the stigma capitate. Fruit globose, 6 mm. in diameter, the persistent calyx explanate, 3 mm. across; stigma columnar, pyrenes 4 or 5, reticulately striate, elliptic-trigonous, 5 mm. long, 2 mm. wide on the back, the endocarp coriaceous, rough and hairy.

CHINA: Kwangtung: Heung-shan, *K. P. To* (CCC) 2235 (LU, NY); Hung-tung, *S. S. Sun* 9825 (NY). Hongkong: *M. Bon* 344 (P); *Champion* (fragment from TYPE, A); *W. Y. Chun* 5070 (A), 6094 (A), 6989 (NY); *J. Esquirol* 1299 (P); *F. B. Forbes* 83 (B), 178 (B); *C. Ford* in 1879 (A, NY, US), in 1893 (A, NY, US); *Mrs. Gibbs* (ex Herb. Hongkong no. 10259) (A); *Hance* (G), 573 (NY); *Y. W. Taam* 1509 (A); *W. T. Tsang* 29656 (A); *Y. Tsiang* 152 (A, NY), 235 (A), 267 (A), 280 (A, US), 302 (A); *Wilford* (G); *C. Wright* 98 (G, NY, US). Kouloun City: *D. T. Dunn* 46 (A). Kwangsi: Shang-sze, *W. T. Tsang* 22116 (A, LU).

Except for a collection from southeastern Kwangsi, *Ilex memecylifolia* is known only from Hongkong Island. There it grows as a shrub on dry slopes, in thickets and woods, and also along roadsides. It blooms in April. The flowers are white and fragrant (Tsang).

In leaf form and leaf texture *Ilex memecylifolia* is closely related to *Ilex elmerrilliana* S. Y. Hu, but the latter differs in having glabrous stems, uniflorous individual branches of staminate fascicles, glabrous staminodes, rostellate rudimentary ovary, and pyrenes with only one branched median longitudinal stria.

The specimen collected by C. Wright at Hongkong has both large (8 cm. long, 3 cm. wide) and small (3 cm. long, 1.5 cm. wide) leaves on a single branch. Thus *Ilex memecylifolia* var. *oblongifolia*, distinguishable by leaf size only, is not worthy of recognition.

92. *Ilex sinica* (Loes.), comb. nov.

*Ilex malabarica* Bedd. var. *sinica* Loes. in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 89: 281 (Monog. Aquif. 2: 281). 1908.

An evergreen tree up to 8 m. high with cinereous branchlets, coriaceous opaque bluish-olivaceous oblong entire leaves acuminate at the apex, fasciculate inflorescences, 3-flowered cymose staminate branches, 4-6-merous flowers, long rostellate rudimentary ovaries, small globose fruits, and 6 reticulately striate pyrenes.

Branchlets subterete, third year's growth 3-4 mm. in diameter, the lenticels orbicular, sometimes very conspicuous, the leaf-scars small,



semi-orbicular; second year's growth 2–3 mm. in diameter, puberulous; lenticels sometimes present, inconspicuous; current year's growth 2 mm. in diameter, thickly puberulous, longitudinally striate-sulcate; terminal buds conic, acute, puberulous, the scales loose. Leaves found also on second year's growth, 5–15 mm. apart; stipules scale-like, narrowly deltoid, 1.25 mm. long, acute, puberulous; petioles 5–8 mm. long, about one-twelfth the length of the lamina, puberulous, narrowly canaliculate above; lamina thinly coriaceous, bluish olivaceous, opaque on both surfaces or slightly shiny above, sparsely and minutely puberulous at the base and on the lower surfaces, oblong or oblong-elliptic, (5–)7–10(–13) cm. long, 2.5–4 cm. wide; base obtuse, rarely narrowly so; apex acuminate, the acumen 5–20 mm. long; midrib narrowly and deeply impressed and puberulous above, elevated and puberulous beneath, the lateral nerves 10–14 on each side, obscure or sometimes evident on both surfaces, the reticulations of the veinlets obscure. Inflorescences fasciculate with active or abortive terminal buds, puberulous; bracts lanceolate, 1–2 mm. long, puberulous. Staminate inflorescences: individual branches of the fascicles 3-flowered, cymose, the peduncles and pedicels 3–4 mm. long; flowers 4–5-merous; calyx cyathiform, puberulous, 2–2.5 mm. across, 4–6-lobed, the lobes deltoid, acute, sometimes sparsely ciliate; corolla rotate, 6 mm. across, the petals oblong, eciliate, one-tenth connate at the base; stamens 4, equaling or slightly longer than the petals, the anthers ovate-oblong; staminode slightly shorter than the petals, the sterile anthers cordate, slightly puberulous, the filament glabrous; rudimentary ovary ovoid, 1 mm. in diameter, the apex rostellate, the beak 0.5 mm. long. Pistillate inflorescences: individual branches of the fascicles uniflorous; pedicels 5–6 mm. long, with 2 scale-like basal prophylla; flowers 6–9-merous; calyx 3–4 mm. wide; corolla rotate, 6 mm. across, the petals 6–9; staminodes slightly shorter than the petals, the sterile anthers cordate, slightly puberulous, the filament glabrous; ovary globose, 2 mm. in diameter, the style evident, 0.5 mm. long, the stigma very conspicuous, columnar-capitate, 1 mm. in diameter. Fruit globose, 4 mm. in diameter, the persistent calyx subexplanate, 3 mm. across, the persistent style 1 mm. long, the stigma mammiform. Pyrenes 6, oblong in outline, the ends obtuse, 3 mm. long, 1–1.5 mm. wide, reticulately striate, the endocarp smooth, coriaceous.

CHINA: Kwangsi: Shuen-yuen, *T. S. Tsoong* (= *Z. S. Chung*) 81529 (A), 81536 (A). Yunnan: without precise locality, *G. Forrest* 26644 (A); Mengtze, *A. Henry* 10471 (A, US); Szemao, *A. Henry* 12595 (A, NY, ISOTYPE of *Ilex malabarica* var. *sinica*), 12595A (A, US). Fo-hai, *C. W. Wang* 73659 (A), 73660 (A), 74201 (A).

The descriptions of the staminate and pistillate flowers are drawn respectively from *Tsoong* 81529 and *Forrest* 26644.

*Ilex sinica* was first recorded from Szemao in southeastern Yunnan. Recently collected material from southwestern Yunnan and Kwangsi matches *A. Henry's* specimens well. In subtropical southwestern China *Ilex sinica* grows as a tree in mixed forests at an altitude of 1500 m. Its

white flowers appear in May. The fruit turns red in November.

*Ilex sinica* was first published as a variety of *Ilex malabarica* Bedd. I have studied a fragment of Beddome's type and another pistillate specimen from Bombay. These Indian plants do not have styliiferous ovaries. Their sterile anthers are glabrous and their leaves have 7 or 8 lateral nerves which are evident on the lower surfaces. In these characters they differ from the geographically remote plant of China and justify treating the latter as a distinct species.

*Ilex sinica* is closely related to *Ilex memecylifolia* Champ. ex Benth., but it differs from the latter in having larger leaves (average 7–10 cm. long, 3–4 cm. wide), smaller fruits (ca. 4 mm. in diameter) and 6 small pyrenes (ca. 3 mm. long). The leaves of *Ilex memecylifolia* are 4–6 cm. long, 2–3 cm. wide, its fruits 6 mm. in diameter, and its 5 pyrenes 5 mm. long.

93. *Ilex tutcheri* Merr. in Philipp. Jour. Sci. Bot. 13: 143. 1918.

A large glabrous evergreen shrub up to 4 m. high with very thick-coriaceous obovate punctate leaves, rounded and retuse or rarely obtuse apex, completely obsolete lateral nerves, fasciculate inflorescences, long fruiting pedicels (10 mm. long), globose fruit with mammiform stigma and 5 or 6 striate pyrenes.

Branchlets glabrous, terete, brunneous or castaneous; third year's growth 3 mm. in diameter, smooth, the lenticels lacking, the leaf-scars deltoid, elevated; second year's growth slightly thinner, ridged; current year's growth 1.8–2 mm. in diameter, angular, the terminal buds ovoid, with loose glabrous scales. Leaves occurring even on the third year's growth, 3–7 mm. apart; stipules deltoid, acuminate, 1 mm. long, persistent; petioles 4–8 mm. long, about one-sixth as long as the lamina, glabrous and rugose, deeply canaliculate above, narrowly winged on the distal half; lamina thick-coriaceous, olivaceous, shiny above, opaque and punctate beneath, obcordate, obovate or rarely obovate-elliptic, 3–6 cm. long, 1.3–2.5 cm. wide; base acute or cuneate; apex rounded and retuse or rarely obtuse; margin entire, recurved; midrib deeply impressed and very minutely and sparsely puberulous above, prominently elevated and glabrous beneath, the lateral nerves indistinct on both surfaces. Inflorescences fasciculate, axillary, on second and third years' growth; bracts callose, tricuspidate, minutely puberulous; flowers 4–6(–7)-merous. Staminate inflorescences: individual branches of the fascicles 3-flowered, cymose, peduncles 2–3 mm. long, sparsely and minutely puberulous, the pedicels 3–4 mm. long, puberulous, with 0–2 broadly deltoid puberulous basal prophylla; calyx patelliform, rugose or minutely puberulous, 3 mm. across, shallowly 5–7-lobed, the lobes rounded, eciliate or very rarely sparsely ciliate; corolla rotate, 7 mm. across, the petals 4 or 5, oblong, 2.5 mm. long, eciliate, one-tenth connate at the base; stamens nearly as long as the petals, glabrous, the anthers oblong-ovoid; rudimentary ovary globose, papillose, the middle distinctly 4- or 5-lobed. Pistillate flowers not seen. Infructescence: individual branches of the fascicles uniflorous; pedicels 8–10 mm. long, puberulous, with 1 or 2 sub-basal prophylla. Fruit globose, 5 mm. in diameter,

the persistent calyx explanate, 4 mm. across, rounded in outline, the stigma mammiform. Pyrenes 5 or 6 (7 according to Merrill), broad-elliptic in outline, 2–3 mm. long, 1–1.25 mm. wide, smooth, with 2 or 3 elevated striae on the back, the endocarp coriaceous.

CHINA: Kwangtung: Wung-yuen, *S. K. Lau* 895 (A, NY), 2569 (A); Loh-fau-shan, *C. O. Levine* (CCC 557) (A); *E. D. Merrill* 10377 (A, TYPE); Tseng-shing, *W. T. Tsang* 20346 (A, NY); Lung-moan, *W. T. Tsang* 20460 (A, NY, US); Ts'ung-hwa, *W. T. Tsang* 25105 (A); Ho-yuen, *W. T. Tsang* 28772 (A); Sin-fung, *Y. W. Taam* 656 (A), 669 (A), 840 (A).

I have seen no material of *Ilex tutcheri* from outside of Kwangtung province. The plant is localized in eastern parts of the province between Long. 113–115 degrees E. and Lat. 23–25 degrees N. It grows in thickets or woods and produces white flowers in May. The fruit becomes red in November.

The long-fruited pedicels and the thick-coriaceous leaves of *Ilex tutcheri* indicate a close relationship with *Ilex memecylifolia* Champ. ex Benth. The latter, however, differs in having shortly acuminate leaves, reticulately striate pyrenes, and epunctate lower leaf-surfaces. *Ilex tutcheri*, in having thick-coriaceous punctate retuse leaves and small striate esulcate pyrenes, shows relationship also with *Ilex championii* Loes., a species which differs in having very short (2–3 mm.) fruited pedicels.

According to Merrill, the ovary of *Ilex tutcheri* is 6- or 7-celled. Specimens I have seen, however, have 5- or 6-celled ovaries.

94. *Ilex salicina* Hand.-Mzt. in *Sinensia* 3(8): 187. 1933.

An evergreen shrub with glabrescent branchlets, linear-lanceolate punctate leaves, fasciculate inflorescences, styliiferous ovary, globose fruits and 6 striate pyrenes.

Branchlets very minutely and sparsely puberulent, glabrescent, castaneous; third year's growth 2.5–3 mm. in diameter, longitudinally striate-rugose, the lenticels numerous, conspicuous, the leaf-scars semi-orbicular, elevated; second year's growth 2.5 mm. in diameter, the lenticels numerous; current year's growth 1.75 mm. in diameter, sulcate, very sparsely and minutely puberulent, the terminal buds conic, with loose puberulent scales. Leaves occurring also on the second year's growth, crowded, usually 2–3 mm. (rarely up to 20 mm.) apart; stipules minute, callose, very shortly and broadly deltoid; petioles 6–10 mm. long, about one-tenth the length of the lamina, glabrous, deeply canaliculate above, rugose beneath; lamina coriaceous, linear-lanceolate, 4.5–11 cm. long, 9–23 mm. wide, brunneous-olivaceous, shiny above, opaque and punctate beneath; base cuneate; apex acuminate, the very tip obtuse; margin entire, recurved; midrib impressed and glabrous above, elevated beneath, the lateral nerves 9–12 on each side, indistinct above, evident beneath, near the margin reticulate, the reticulation of the veinlets obscure above, evident beneath. Inflorescences pseudo-fasciculate, axillary on second year's growth, often with abortive terminal buds, rarely with active ones, the central axis up to 6 mm. long, puberulent; the bracts ovate, acute, puberulent,

eciliate; flowers 4–6-merous. Staminate inflorescences: individual branches of the fascicles 1–4-flowered cymose; peduncles 8–10 mm. long, puberulent, the pedicels 2–3 mm. long, with 0–2 basal prophylla; calyx cyathiform, 3 mm. across, puberulent, shallowly 6-lobed, the lobes rounded, ciliate; corolla rotate, ca. 7 mm. across, the petals oblong, 3 mm. long, eciliate, one-tenth connate at the base; stamens equaling the petals in length, the anthers ovoid; rudimentary ovary globose-ovoid, minute, 0.75 mm. long, the apical end obtuse, inconspicuously 4–6-lobed. Pistillate inflorescences: individual branches of the fascicles uniflorous, rarely 2- or 3-flowered cymose; pedicels 1–2 cm. long, puberulous and ciliate; corolla choripetalous, the petals oblong, 3 mm. long; staminodes one-third the length of the petals, the sterile anthers sagittate; ovary globose-ovoid, 2 mm. in diameter, the style 1 mm. long, the stigma columnar, pubescent. Fruit globose, 6 mm. in diameter, the persistent calyx subexplanate, 5 mm. across, the lobes rounded, ciliate, the style evident, 1 mm. long, the stigma columnar-mammiform. Pyrenes 4–6, elliptic in outline, the ends pointed, 4–5 mm. long, 2 mm. wide, longitudinally 3- or 4-ridged but esulcate on the dorsal surface, smooth or with a single ridge on the side, the ridge removable, the endocarp coriaceous.

CHINA: Kwangtung: Fang-ch'eng (Na-leung), *W. T. Tsang* 26501 (A); Kung-p'ing-shan, *W. T. Tsang* 26678 (A). Kwangsi: south of Nan-ning, Seh-fong-dar-shan, *R. C. Ching* 8338 (NY, ISOTYPE); Shang-tze, Shap-man-tai-shan, *W. T. Tsang* 21956 (A), 22035 (A); *H. Y. Liang* 69644 (A).

INDO-CHINA: Tonkin: Pac-si, *W. T. Tsang* 26907 (A); Hacoï, *W. T. Tsang* 29045 (A); Dam-ha, *W. T. Tsang* 29930 (A).

*Ilex salicina* is endemic to the tropical forests along the Kwangtung-Kwangsi-Indo-China border. It is a common shrub in thickets or in swampy places. The fragrant white flowers appear in April. The mature fruit is red.

In its low shrubby habit, its fasciculate inflorescences, its long-pedunculate individual branches of the staminate flowers, its styliiferous ovary, its columnar and pubescent stigmata, and striate-esulcate coriaceous endocarp, *Ilex salicina* reveals its very close relationship with *Ilex metabaptista* Loes. The latter differs only in being pilose all over and in having epunctate leaves. *Ilex salicina* is perhaps no more than varietally distinct.

The descriptions of the staminate and pistillate flowers are drawn respectively from *Tsang* 22035 and 29045.

#### 95. *Ilex dolichopoda* Merr. & Chun in Sunyats. 5: 107. 1940.

An evergreen tree up to 7 m. high, with stout minutely puberulent branchlets, large (20 cm. long) entire leaves, fasciculate infructescences, very long (2.5–3 cm.) pedicels, globose fruits with mammiform stigma, and 5 or 6 striate pyrenes.

Branchlets cinereous; third year's growth 6 mm. in diameter, longitudinally minutely rimulose, the lenticels minute, inconspicuous, the leaf-scars oblong, suborbicular, 4.5 mm. in diameter, slightly elevated; second

year's growth 5 mm. in diameter; current year's growth 4–5 mm. in diameter, subterete; the terminal buds pulvinate, minutely puberulent. Leaves occurring also on second year's growth, 15–25 mm. apart; stipules callose, broadly and shortly deltoid, acute; petioles terete, stout, 4 mm. in diameter, 8–10 mm. long, about one-twentieth the length of the lamina, very narrowly canaliculate above, otherwise rugose; lamina coriaceous, griseous-olivaceous, slightly shiny above, opaque beneath; oblong or obovate-oblong, the lower half almost cuneate, 18–25 cm. long, 6–7 cm. wide; base rounded; apex deltoid-acute; margin entire, when dry slightly recurved; midrib narrowly impressed, glabrous above, thickly elevated beneath, the lateral nerves 12–15 on each side, obscure above, prominent and elevated beneath, the reticulation of the veinlets obscure above, prominent beneath. Infructescences fasciculate, axillary on second year's growth, the fascicles 9–16-flowered, the individual branches unflowered, the bracts broadly deltoid, acute; pedicels 28–32 mm. long, puberulent; prophylla 1 or 2, unevenly inserted, 4–8 mm. above the base of the pedicel; persistent calyx explanate, puberulent, 7 mm. in diameter, broadly 6-lobed, the lobes semiorbicular or reniform, 1.5 mm. long, 3 mm. wide at the base, very minutely ciliate or eciliate. Fruit (young) subglobose, 8 mm. in diameter, when dry smooth, shiny, brown, punctate with yellow spots, the stigma columnar-mammiform. Pyrenes 5 or 6, elliptic in outline, 5 mm. long, 1–2 mm. wide, 3-striate on the dorsal surface, reticulately striate on the side, the mature endocarp not seen.

CHINA: Hainan: Po-ting, *F. C. How* 27955 (A, TYPE).

*Ilex dolichopoda* appears to be endemic to Hainan Island. It grows as a tree in forested ravines at an altitude of 600 m. Its flowers probably appear in May, since its fruits are still very young in middle June.

The fasciculate infructescences, the long fruiting pedicels, and the prominent stigma on the fruit of *Ilex dolichopoda*, all point to a very close relationship with *Ilex cochinchinensis* (Lour.) Loes. The latter has only proportionally longer petioles (about one-eighth as long as the lamina) and smaller leaves. The two may not be distinct.

96. *Ilex kobuskiana*, sp. nov.

Frutex vel arbor parva, glaberrima; foliis coriaceis, integerrimis, subtus punctatis, oblongis, raro ellipticis, 4.5–9 cm. longis, 1.5–4 cm. latis, basi rotundatis vel obtusis, raro cuneatis; apice breviter acuminatis, acuminibus 5–7 mm. longis, retusis vel obtusis, costa supra plana, subtus elevata, nervis lateralibus supra obscuris, subtus prominentibus; inflorescentiis fasciculatis, ♂ 3-floris, pedunculis 1.5–3 mm. longis, pedicellis 2 mm. longis, ♀ 1-floris, pedicellis 5–8 mm. longis; floribus 5–8-meris; calycibus 3.5–4 mm. diametro, 6-lobis, ciliatis; corolla rotata; staminibus cum petalis aequilongis; fructibus globoso-ovoideis, 4 mm. diametro, stigmatibus umbilicatis; pyrenis 6, 4 mm. longis, striatis, esulcatis, endocarpiis coriaceis.

An evergreen shrub or small tree up to 20 m. high with glabrous branchlets, large ovate or oblong-elliptic entire punctate leaves, abruptly

and shortly acuminate apices, fasciculate inflorescences, puberulent short pedicels, 6–8-merous flowers, retuse staminodes, globose drupes with large navel-like stigmas, and 6 striate-esulcate pyrenes.

Branchlets subterete, glabrous, castaneous when dry; third year's growth 4 mm. in diameter, longitudinally rimulose, rugose with numerous conspicuous lenticels, the leaf-scars very narrowly crescent-shaped, plane; second year's growth 3 mm. in diameter, the lenticels numerous and conspicuous; current year's growth angular, 2.5 mm. in diameter, glabrous, the terminal buds broadly oval, puberulous, unfolding after anthesis. Leaves occurring also on second year's growth, 5–20 mm. apart; stipules callose, deltoid, acute; petioles 9–12 mm. long, about one-eighth the length of the lamina, glabrous, deeply canaliculate above, rugose beneath; lamina thickly coriaceous, brunneous, shiny above, opaque and punctate beneath, broad-elliptic or oblong, 4.5–9 cm. long, 1.5–4 cm. wide; base rounded or obtuse, very rarely cuneate; apex abruptly and shortly acuminate, the acumen 5–7 mm. long, the point obtuse or retuse; margin entire; midrib plane or slightly elevated above, prominent and elevated beneath, the lateral nerves 9 or 10 on each side, obscure above, prominent beneath, anastomosing near the margin, the reticulations of the veinlets evident beneath. Inflorescences fasciculate, axillary, on second year's growth, with abortive terminal buds, the bracts callose, tricuspidate, minutely puberulous. Staminate inflorescences: individual branches of the fascicles 3-flowered, cymose; peduncles 1.5–3 mm. long, the pedicels 2 mm. long, glabrescent, with 2 basal prophylla; pistillate fascicles uniflorous, the pedicels 5–8 mm. long, puberulous, the prophylla 2, submedian; flowers 5- or 6-merous; calyx patelliform, 3.5 mm. across, rugose, shallowly 6-lobed, the lobes rounded, ciliate; corolla rotate, 6–7 mm. across, the petals obovate-oblong, 3 mm. long, one-fifth connate at the base; stamens equaling the petals in length, the anthers oblong; rudimentary ovary pulvinate, the apex obtuse. Pistillate inflorescences: individual branches of the fascicles uniflorous; pedicels 5–8 mm. long, puberulous, with 2 submedian prophylla; flowers 5–8-merous, calyx 4 mm. across, 6-lobed, the lobes rounded, ciliate; corolla rotate, 7 mm. across, the petals 6–8, ovate-oblong, 3 mm. long, one-fifth connate at the base; the staminodes three-fourths the length of the petals, the sterile anthers sagittate, with a retuse apex; ovary broadly ovoid, the apex obtuse with navel-like stigma. Fruit globose-ovoid, 4 mm. in diameter, the persistent calyx 4 mm. across, orbicular in outline, the lobes ciliate. Pyrenes 6, elliptic in outline, the ends pointed, 4 mm. long, 1.8–2 mm. wide, longitudinally striate and esulcate, the endocarp coriaceous.

CHINA: Kwangtung: Ta-pu, *W. T. Tsang* 21145 (TYPE for pistillate flower and fruits, A; K, LU, NY). Hainan: Bak-sa, *S. K. Lau* 26603 (A), 26619 (A); Lok-tung, *S. K. Lau* 27250 (A), 27258 (A).

INDO-CHINA: *A. Chevalier* 41250 (NY).

*Ilex kobuskiana* is a native of eastern Kwangtung and Hainan. It forms a shrub or small tree in woods or thickets and flowers in May. The fruit has been reported to be red.

The coriaceous entire leaves, the fasciculate inflorescences, and the striate esulcate pyrenes of *Ilex kobuskiana* suggest a close relationship with *Ilex wilsonii* Loes. The latter differs in having epunctate smaller leaves, 4-merous flowers, glabrous pedicels, and thickly discoid stigma. The punctate entire leaves of *Ilex kobuskiana* are similar to those of *Ilex cochinchinensis* (Lour.) Loes. The latter species, however, has the fruiting pedicels exceeding the pedicels and the stigma is columnar.

The staminate flower has been described from *Lau 26619*.

This species is named in honor of Dr. C. E. Kobuski, Curator of the Herbarium of the Arnold Arboretum, Harvard University.

97. *Ilex retusifolia*, sp. nov.

Frutex pubescens; foliis coriaceis, ellipticis, 5–7 cm. longis, 2–3 cm. latis, subtus punctatis, basi obtusis, apice breviter acuminatis et retusis, integerrimis; costa supra et subtus elevata pubescenteque; nervis lateralibus utrinque 7–9 obscuris; inflorescentiis fasciculatis, unifloris; pedicellis 4–5 mm. longis, puberulentibus; floribus 4- vel raro 5-meris; calycibus 2.5 mm. diametro, puberulentibus, ciliatis; corolla 5 mm. diametro, chori-petala; petalis ovatis, 2.5 mm. longis, eciliatis; staminodiis quam petalis  $\frac{1}{2}$  brevioribus; ovario ovoideo-globo, 1 mm. diametro, stigmate discoideo.

An evergreen shrub with puberulent branchlets, petioles, and midribs, broad elliptic entire leaves, retuse apices, fasciculate inflorescences, and glabrous staminodes.

Branchlets terete, castaneous when dry, puberulent; third year's growth 3 mm. in diameter, the older portion with small elliptic lenticels; second year's growth 2 mm. in diameter, longitudinally plicate, rugose, the lenticels lacking; current year's growth 1.5 mm. in diameter, longitudinally ridged and sulcate, the terminal buds ovoid-conic, puberulent. Leaves occurring even on the fourth year's growth, 5–15 mm. apart; stipules deltoid, acute, persistent; petioles 8–12 mm. long, one-seventh to one-fourth as long as the lamina, puberulent, broadly and shallowly canaliculate above; lamina coriaceous, olivaceous-brunneous, opaque on both surfaces, punctate beneath, broad-elliptic, 5–7 cm. long, 2–3 cm. wide; base obtuse; apex very shortly produced and retuse; margin entire; midrib elevated and pubescent on both surfaces, the lateral nerves in 7–9 pairs, obscure on both surfaces, the reticulation of the veinlets obsolete. Pistillate inflorescences fasciculate, axillary on second year's growth, the individual branches uniflorous, the bracts broadly deltoid, tricuspidate, puberulent; pedicels 4–5 mm. long, puberulent, with 2 deltoid puberulent sub-basal prophylla; flowers 4- or rarely 5-merous; calyx patelliform, 2.5 mm. across, puberulent, deeply 4-lobed, the lobes obtuse, retuse, or rounded, ciliate; corolla rotate, 5 mm. across, choripetalous, the petals ovate, 2.5 mm. long, eciliate; staminode one-half the length of the petals, the sterile anthers ovate-cordate, glabrous; ovary ovoid-subglobose, 1 mm. in diameter, the style evident, very short, the stigma discoid, convex. Staminate flowers and fruits not seen.

CHINA: Kwangsi: Shing-an-hsien, *T. S. Tsoong* (= *Z. S. Chung*) 81819 (TYPE, A).

*Ilex retusifolia* is a shrub endemic to the tropical forests of southwestern Kwangsi. Its yellowish flowers appear in June.

The broadly elliptic leaves, the elevated midrib, and the 4-merous flowers of *Ilex retusifolia* closely relate this species to *Ilex wilsonii* Loes., but the latter has epunctate glabrous leaves with caudate apices.

98. *Ilex cochinchinensis* (Lour.) Loes. in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. 78: 230 (Monog. Aquif. 1: 230). 1901; Pitard in Lecomte, Fl. Gén. Indo-Chine 1: 853. 1912; Merr. in Trans. Amer. Phil. Soc. New Ser. 24(2): 245 (Lour. Fl. Cochinch. 245). 1935.

*Hexadica cochinchinensis* Lour. Fl. Cochinch. 562. 1790; 687. 1793.

*Ilex ardisioides* Loes. op. cit. 359. 1901; Hayata in Jour. Coll. Sci. Tokyo 30: 53. 1911; Yamamoto, Suppl. Ic. Pl. Form. 1: 30, fig. 10. 1925; Kanehira, Form. Trees 369. 1936; Hu & Tang in Bull. Fan. Mem. Inst. Biol. Bot. Ser. 9: 254. 1940. *Syn. nov.*

*Ilex cleyeroides* Hayata, Ic. Pl. Form. 3: 53. 1913. *Syn. nov.*

*Ilex oligadenia* Merr. & Chun in Sunyats. 5: 108, pl. 14. 1940. *Syn. nov.*

An evergreen tree up to 9 m. high with large elliptic or oblong-elliptic entire punctate leaves, fasciculate inflorescences, globose fruits, columnar-mammiform stigma and 4 or 5 pyrenes.

Branchlets subterete, brunneous or castaneous, longitudinally plicate-rugose; third year's growth 4 mm. in diameter, the lenticels minute, the leaf-scars suborbicular, slightly elevated; second year's growth 2.5–3 mm. in diameter, the lenticels minute, inconspicuous; current year's growth angular, minutely and sparsely puberulent below the terminal bud and in the grooves, otherwise glabrous, the lenticels often evident, the terminal buds subglobose, very minutely puberulous. Leaves occurring also on second year's growth, 3–5 mm. apart; the stipules broadly deltoid, callose, often obscure; petioles 7–10 mm. long, one-sixteenth to one-twelfth as long as the lamina, glabrous, shallowly and broadly canaliculate above, transversely plicate-rugose beneath; lamina thin-coriaceous, olivaceous or brunneous-olivaceous, opaque on both surfaces, punctate beneath, elliptic or oblong-elliptic, 9–16 cm. long, 2.5–4.5 cm. wide; base obtuse or cuneate; apex acuminate, the acumen 3–10 mm. long, the very tip acute or obtuse; margin entire; midrib narrowly impressed above, prominently elevated beneath, both glabrous, the lateral nerves in ca. 8 pairs, obscure above, prominent underneath, reticulate near the margin, the reticulation of the veinlets evident only beneath. Inflorescences fasciculate, axillary on second year's growth; flowers 4- or rarely the calyx 5-merous. Staminate inflorescences: individual branches of the fascicles 3-flowered, the bracts very shortly and broadly deltoid, acute, thick-coriaceous; peduncles 4–6 mm. long, the pedicels 1–2 mm. long, glabrescent or minutely puberulent; calyx patelliform, glabrescent, deeply 4-, rarely 5-lobed, the lobes rounded, ciliate; corolla rotate, the petals ovate, eciliate, one-fourth connate at the base; stamens shorter than the petals, the anthers oblong-ovoid, 0.8 mm.



long; rudimentary ovary pulvinate, shortly rostellate. Pistillate flowers not seen. Infructescences: individual branches of the fascicles uniflorous; pedicels 8–9(–15) mm. long, puberulous, with 0–2 basal prophylla. Fruits globose, 5–6 mm. in diameter, the persistent calyx subcyathiform, 5 mm. across, pubescent, shallowly 4-lobed, the lobes rounded, ciliate, the stigma columnar-mammiform, with thick exocarp. Pyrenes 4 or 5, oblong-trigonal in outline, 6 mm. long, 2.5 mm. wide on the back, smooth, the endocarp coriaceous.

CHINA: Taiwan: South Cape, *A. Henry 1311* (ISOTYPE of *Ilex ardisioides*, A). Hainan: Po-ting, *F. C. How 72496* (TYPE of *Ilex oligadenia*, A); Kan-en, *S. K. Lau 5406* (A); without precise locality, *H. Y. Liang 64712* (A, NY).

INDO-CHINA: Tonkin: *Bon 3366* (fragment, A); *Loureiro* (photo of TYPE of *Hexadica cochinchinensis*, A); Sai-wang-mo-shan, *W. T. Tsang 30421* (A).

*Ilex cochinchinensis* was first described as *Hexadica cochinchinensis* by Loureiro (1790) from his own material collected in Indo-China. A comparison of a photograph of this type with the Taiwan and Hainan material shows them to be conspecific. In China it grows as a tree in the tropical and subtropical forests. The flowers may appear in late February and last until April.

The fruits of Loureiro's specimen are too young for a study of the pyrenes. These structures were first described when Loesener gave his account of the synonymous *Ilex ardisioides*. Concerning the pyrenes he wrote, "dorsó convexo medio longitudinaliter 1-striate a costa media striis minoribus paucis utrinque ascendentibus, ceterum esulcatis." This needs correction. The reticulate vascular bundles on the pyrene of *A. Henry 1311* fall off so readily that the pyrenes appear to be naturally smooth.

In its punctate lower leaf-surfaces, its fasciculate inflorescences, and its prominent stigmata, *Ilex cochinchinensis* is closely related to *Ilex salicina* Hand.-Mzt., but differs in its broader leaves. In its long-pedicellate fruit, prominent stigma, and prominent venation of the leaves, *Ilex cochinchinensis* also resembles *Ilex dolichopoda* Merr. & Chun, but the latter has extraordinarily large leaves (18–25 cm. long, 6–7 cm. wide) with a rounded base, and very long fruiting pedicels (3 cm. long). It is also a very poorly known species. Until more collections become available for study, it seems best to accept it as distinct, at least provisionally.

*Ilex cochinchinensis* was once erroneously recorded from Hainan. That report was based on *W. T. Tsang 697* (LU 17446), which turned out to be an *Ehretia*.

(To be concluded)

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THE GENUS *ILEX* IN CHINA, V

SHIU-YING HU

(Continued from page 240)

SERIES 3. LONGECAUDATAE, SER. NOV.

Arbor, raro frutex; ramulis glabris vel puberulentibus; foliis coriaceis, subtus punctatis vel epunctatis, apice caudatis, acuminatis, raro obtusis et retusis; inflorescentiis fasciculatis, ramulis singulis ♂ 3-floris, ramulis singulis ♀ unifloris, raro 2-5-floris cymosis; floribus 4-meris, raro 5- vel 6-meris; ovario abortu globoso vel pulvinato et breviter rostellato; fructibus parvis, globosis, 3-5 mm. diametro; pyrenis 4, raro 5, striatis, striis elevatis; endocarpio coriaceo.

The entire leaves, the fasciculate inflorescences and the striate coriaceous pyrenes of this section suggest close relationship with series *Sideroxyloideae*, but the latter has 5-8-merous flowers (rarely 4-merous), columnar stigmata, and large fruits with thick exocarp.

KEY TO THE SPECIES

- A. Leaves punctate, olivaceous.  
B. Leaves 2.5-4.5 cm. long, elliptic, obovate-elliptic or subrhomboidal, the apex obtuse and retuse or shortly produced and retuse; stigma of the fruit plane, navel-like. (Kwangtung) . . . . .99. *I. buxoides*.  
BB. Leaves 4-11 cm. long, ovate-elliptic, the apex caudate or acuminate, the very tip mucronate or cuspidate, rarely obtuse; stigma of the fruit elevated.  
C. Individual branches of pistillate fascicles 1-5-flowered, cymose; fruit small, ca. 3 mm. in diameter, the stigma thick-discoid, the style wanting; apex of the leaf acuminate. (Chekiang, Kweichow and Kwangsi) . . . . .100. *I. kengii*.  
CC. Individual branches of pistillate fascicles always uniflorous; fruit 3-4 mm. in diameter, the stigma discoid, 4-5-lobed, the style evident; apex of the leaf caudate. (Yunnan) . . . . .  
. . . . .101. *I. longecaudata*.

- AA. Leaves epunctate.
- B. Leaves oblong or obovate, griseo-olivaceous, the apex rounded or obtuse, rarely retuse or emarginate; inflorescence usually basal to current year's growth; stigma of fruit capitate. (Hainan).....102. *I. liangii*.
- BB. Leaves broad-elliptic, ovate or elliptic, brunneous or olivaceous, the apex acuminate, caudate or shortly produced and retuse; inflorescence usually fasciculate; fruit variable.
- C. Leaves suborbicular or broad-elliptic, the apex shortly produced, usually retuse; individual branches of the infructescence 1-3-flowered, cymose. (Taiwan north to Honshu and south to Hainan).....103. *I. goshiensis*.
- CC. Leaves ovate, ovate-oblong or ovate-elliptic, the apex acuminate or caudate; individual branches of the infructescence uniflorous.
- D. Branchlets pubescent; leaves elliptic-lanceolate, elliptic or ovate-elliptic, 1-2 cm. wide; stigma of the fruit capitate.
- E. Leaves elliptic or ovate-elliptic, 2-5 cm. long, the apex abruptly caudate, the margin entire. (Taiwan, Liu-kiu).....104. *I. hayataiana*.
- EE. Leaves oblong-elliptic or oblong-lanceolate, 3-7.5 cm. long, the apex gradually acuminate, the margin often 1-2 bristly-toothed. (Kwangtung).....105. *I. oligodonta*.
- DD. Branchlets glabrous; leaves ovate or ovate-oblong, 2-3.5 cm. wide; stigma of the fruit discoid.
- E. Leaves ovate, thick-coriaceous, shiny above, the petioles about one-seventh the length of the lamina; pedicels of the fruit 4, rarely 5 mm. long. (Central, West, and East China, Taiwan).....106. *I. wilsonii*.
- EE. Leaves ovate-oblong, or rarely ovate-lanceolate, sub-coriaceous, opaque on both surfaces, the petioles one-twelfth to one-ninth the length of the lamina; pedicels 5 mm. long. (Fukien).....107. *I. fukiensis*.

99. *Ilex buxoides*, sp. nov.

Arbor pubescens; foliis coriaceis, punctatis, integerrimis ellipticis obovato-ellipticis vel subrhomboidalibus, 2.5-4.5 cm. longis, 1-2 cm. latis, basi cuneatis vel acutis, apice obtusis retusisque vel brevissime acuminatis retusisque, costa supra canaliculata, subtus elevata, nervis lateralibus 5 vel 6 paribus, obscuris; inflorescentiis fasciculatis, puberulis, singulis ♂ 3-floris, raro unifloris, ♀ semper 1-floris, pedunculis ♂ 3-5 mm. longis, pedicellis 2-3 mm. longis; floribus 4- or 5-meris; calycibus patelliformibus, 2 mm. diametro, ciliatis; corolla rotata, petalis basi connatis; staminibus 4, raro 5, quam petalis brevioribus; fructibus globosis, 5 mm. diametro; pyrenis 4, coriaceis, 3-3.5 mm. longis, 2 mm. latis, omnibus partibus reticulato-striatis.

An evergreen tree up to 9 m. high with puberulous branchlets, small coriaceous punctate elliptic or obovate-elliptic or subrhomboidal entire leaves with abruptly acuminate and retuse apex and cuneate base, fascicu-